

Preliminary Amendment on July 19, 2002, is requested. By this Amendment Claims 1, 14, 17 have been amended. New Claims 33-35 have been added. New Claims 33-35 do not add new matter. Allowance of the claims of this application is requested.

Consideration of Claims Previously Submitted by Preliminary Amendment

Applicant submitted new claims 31 and 32 by Preliminary Amendment on July 19, 2002. Applicant included a check in the amount of \$36.00 for these additional claims. Claims 31 and 32 were not considered as part of the Office Action of September 25, 2002. Applicant respectfully requests consideration of these claims. Claims 31 and 32 are reproduced below for the Examiner's convenience:

31. The variable speed drive system of claim 1 wherein said actuating system comprises an electromechanical linear actuation device .
32. The variable speed drive system of claim 3 further comprising a non-rotating chamber system.

Drawing Addition

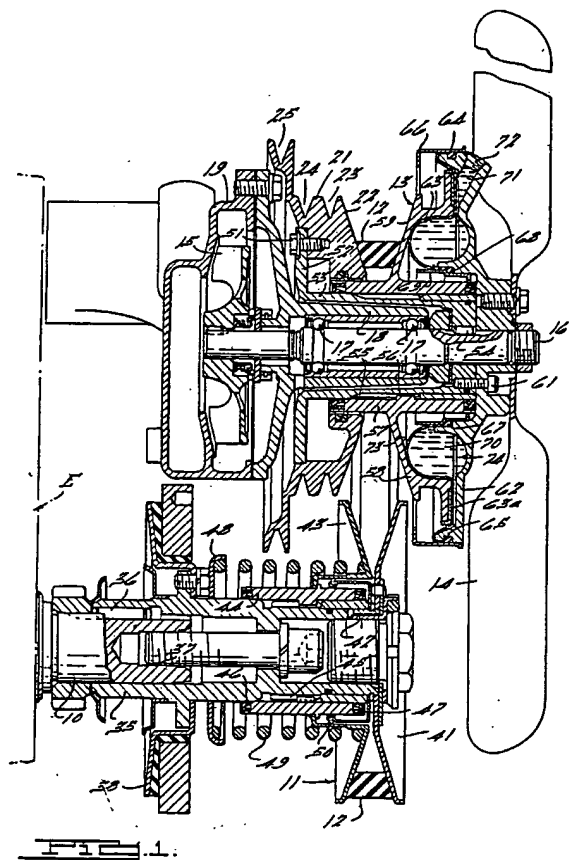
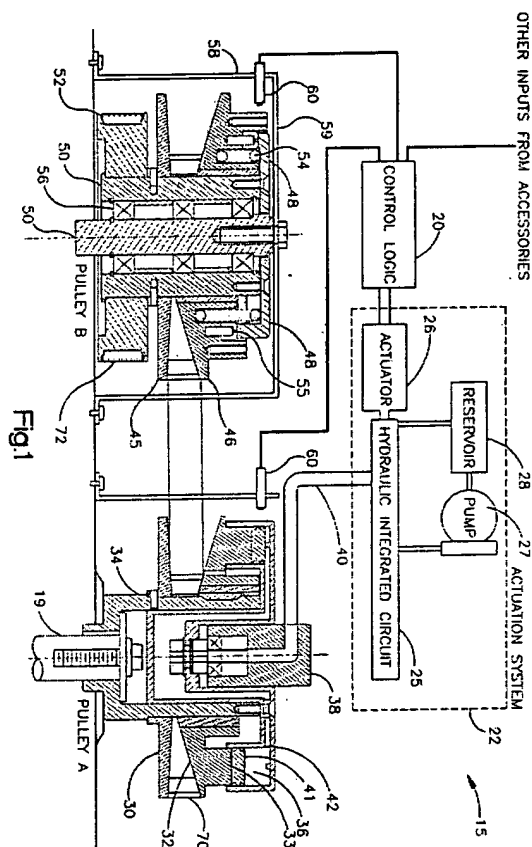
Attached are proposed new drawings, Figures 16 and 17. Figures 16 and 17 include claimed features of the invention including "the vehicle" and "the engine" as claimed in Claims 9, 10 and 13. The proposed new drawings add no new matter.

The §102 Rejections

Reconsideration of the rejection of independent claim 1 as being anticipated under 35 U.S.C. §102 over U.S. Patent 2,909,071 to Smyth et al. [hereinafter Smyth] is respectfully requested.

The Examiner has rejected Claim 1 stating that Smyth discloses all elements of the claim. Applicant respectfully disagrees. Smyth does not disclose every element of claim 1 as amended. Smyth does not disclose an auto-tensioning pulley which drives one or more accessories. Applicant's system and the system of Smyth are reproduced below. Applicant has amended Claim 1 to describe Applicant's auto-tensioning pulley in more detail. The auto-tensioning pulley (labeled Pulley B) of Claim 1 includes a movable flange 46 and spring 54 for maintaining

tension in a first belt 70 which drives the auto-tensioning pulley. Applicant's auto-tensioning pulley is used to drive accessories. Accessories in the Smyth patent are driven by pulley 13. Pulley 13 is not an auto-tensioning pulley. Pulley 13 does not include a movable flange and spring for maintaining tension in a belt. Pulley 13 only discloses hydraulic means for moving a flange in pulley 13. Thus, the driving of accessories by an auto-tensioning pulley of Applicant's Claim 1 is not disclosed in Smyth. Reconsideration of Claim 1 is requested.



Reconsideration of the rejection of Claims 2 is respectfully requested. Claim 2 depends directly from Claim 1 which is believed allowable for the reasons set forth above.

Reconsideration of the rejection of dependent Claim 7 over Smyth '071 is respectfully requested. Claim 7 includes a controllable pulley with first and second movable flanges. The system of Smyth includes two pulleys, however each only includes one movable flange. Pulley

11 includes movable flange 43 and pulley 13 includes movable flange 58. However, neither pulley includes first and second movable flanges. Reconsideration is requested.

Reconsideration of the rejection of dependent Claims 9, 10 and 13 is respectfully requested. Claims 9, 10 and 13 depend directly from Claim 1 which is believed allowable for the reasons set forth above.

Reconsideration of the rejection of independent claim 14 as being anticipated under 35 U.S.C. §102 over Smyth '701 is respectfully requested. Claim 14, as amended, includes a system with first and second controllable pulleys and first and second electromechanical actuating systems for moving movable flanges on the pulleys. Smyth does not disclose a system with two controllable pulleys with electro mechanical actuating systems. Reconsideration is requested.

Reconsideration of the rejection of dependent Claim 15 over Smyth is respectfully requested. Claim 15 includes at least one controllable pulley with first and second movable flanges. As previously stated, the system of Smyth includes two pulleys, however each only includes one movable flange. Reconsideration is requested.

Claim 17 has been amended to include the limitation described in Claim 4. This limitation incorporated in Claim 17 is not disclosed by the prior art for the same reasons, stated below, why the limitation of Claim 4 is not disclosed

The §103 Rejections

Reconsideration of the rejection of Claims 3 and 5 as obvious under 35 U.S.C. §103(a) over Smyth '071 in further view of U.S. Patent 5,971,876 to Spiess et al. [hereinafter Spiess] is respectfully requested. Claims 3 and 5, claim a variable speed drive system for driving accessories with an actuating system comprising hydraulic components. The Examiner states that it would have been obvious to one having ordinary skill in the art at the time of the invention to provide the hydraulic components Spiess within the system of Smyth. Applicant respectfully disagrees.

First, an application using hydraulic controls for only a single pulley in a dual pulley variable speed transmission is not taught by Spiess. Spiess teaches a circuit of pumped hydraulic fluid for varying the clamping force ratio between two pulleys in a transmission system. The

clamping force in *both* pulleys is controlled. Adding the hydraulic circuit of Spiess where both pulleys are controlled via pressurized hydraulic fluid to Smyth would defeat the function of Smyth. The desired centrifugal forces, in the driven pulley, taught by Smyth would be overcome by the forces generated within pressurized hydraulic circuit of Spiess.

Further, there is no motivation in Smyth to utilize the teachings of Spiess. Smyth includes an efficient spring-based system, in the driving pulley, which would not be improved by Spiess' hydraulic system. Smyth states:

As the engine speed increases a speed is reached where the centrifugal force of the rotating fluid mass within the diaphragm 63 of pulley 13 overcomes the belt transmitted opposing force of the spring 49 and then the fluid mass in chamber 70 (Fig. 1) is centrifuged radially outwardly to a new position ... Spring 49 will be compressed as the fluid mass is moved radially outwardly to its chamber 70' position and at the same time the axially shiftable disc 58 will be moved to the left towards the pulley element 21. Movement of the shiftable disc 58 to the left wedges the endless belt 12 radially outwardly along the belt faces 22, 59 of pulley 13 and at the same time pulls the endless belt 12 radially inwardly along the faces 41, 43 of the pulley 11 and compresses spring 49 of pulley 11.

A hydraulic system would likely not be as simple and efficient as a spring in providing a resistance force which may be overcome, resulting in a change in position of shiftable disc and a corresponding increase of resistance force. Thus, one of ordinary skill in the art would not be motivated to replace a spring providing these functions with a hydraulic circuit in a variable speed drive system. Reconsideration is requested.

Reconsideration of the rejection of Claims 4 and 6 as obvious under 35 U.S.C. §103(a) over Smyth '071 in further view of U.S. Patent 5,366,416 to Roovers et al. [hereinafter Roovers] is respectfully requested. Claims 4 and 6 include a control logic module for receiving data from one or more sensing devices and for signaling the actuating system. The Examiner states that it would have been obvious to one having ordinary skill in the art at the time of the invention to provide the control logic of Roovers within the system of Smyth. Applicant respectfully disagrees.

First, an application using a control logic module for only a single pulley in a dual pulley variable speed transmission is not taught by Roovers. Further Smyth describes an accessory driving system that varies inversely with engine speed. Smyth achieves this by moving a pulley

flange with centrifugal force, which is solely a function of engine speed. There is no motivation within Smyth to add control logic to this system or to monitor pressure within its hydraulic chambers or other parameters. As a result, it is not obvious to combine the teachings of Roovers with Smyth. Reconsideration is requested.

Reconsideration of the rejections of Claims 16 is respectfully requested. Claim 16 depends directly or indirectly from amended Claim 14 which is believed allowable for the reasons set forth above.

Reconsideration of the rejection of Claims 8 is respectfully requested. Claim 8 depends directly or indirectly from Claim 1 which is believed allowable for the reasons set forth above.

New Claims 33-35

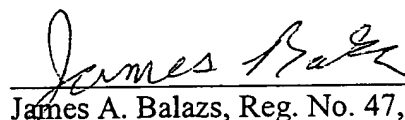
New claims 33 and 34 claim specific elements of the variable speed drive system as vehicle components. Claim 35 claims one of the functions of the claimed sensing devices. The new claims do not introduce new matter. Allowance of new claims 33-35 is requested. Additional fees are due for three new dependent claims (small entity rate) in connection with this amendment. The Examiner is authorized to charge deposit account 03-0172 for these fees.

CONCLUSION

For the reasons set forth above, Claims 1-17 and 31-35 patentably and unobviously distinguish over the references of record and are in condition for allowance. Notice to that effect is respectfully requested. No fees are believed due in connection with this amendment. However, in the event additional fees are due, the Examiner is authorized to charge deposit account 03-0172.

Respectfully Submitted,

Date: 12/26/02


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Marked Specification

FIG. 1 is a schematic view of the variable speed drive system showing sectional views of the controllable and auto-tensioning pulleys;

FIG. 2 is a schematic view of the controllable and auto-tensioning pulleys and various accessories;

FIG. 3 is a sectional view of an embodiment of the invention using a counterweight system;

FIG. 4 is a sectional view of an embodiment of the invention using a non-rotating chamber system;

FIG. 5 is a sectional view of an embodiment of the invention using a second embodiment of the non-rotating chamber system;

FIG. 6 is a sectional view of an embodiment of the invention using a non-rotating chamber located adjacent to the mounting point of the controllable pulley;

FIG. 7A is a sectional view of an embodiment of the invention using a hydraulic or pneumatic cylinder to move a contact flange;

FIG. 7B is a sectional view of a second embodiment of the invention using a hydraulic or pneumatic cylinder to move a contact flange;

FIG. 7C is a sectional view of a third embodiment of the invention using a hydraulic or pneumatic cylinder to move a contact flange;

FIG. 8 is a sectional view of an embodiment of the invention using an electro-mechanical linear actuation device to move a contact flange;

FIG. 9 is a sectional view of an embodiment of the invention using a thermally responsive material to move a contact flange;

FIG. 10 is a sectional view of an embodiment of the invention using a magnetic actuation device to move a contact flange;

FIG. 11 is a sectional view of an embodiment of the invention using a pulley with two movable contact flanges;

FIG. 12 is a sectional view of an embodiment of the invention using a pulley with two hydraulically movable contact flanges;

FIG. 13 is a sectional view of an embodiment of the invention using two controllable pulleys;

FIG. 14 is a sectional view of an embodiment of the invention using a spring venting system; [and]

FIG. 15 [is a] is a schematic view of an the variable speed drive system showing sectional views of an embodiment of the controllable and auto-tensioning pulleys;

FIG. 16 is a perspective view of a vehicle into which the variable speed drive system may be installed; and

FIG. 17 is a schematic view including an engine and pulleys of the variable speed drive system.

Marked Claims

1. A variable speed drive system for driving accessories comprising:

a rotational member;

a controllable pulley in rotational communication with said rotational member, said controllable pulley including a first movable flange and a corresponding adjustable pitch radius;

an auto-tensioning pulley driven by said controllable pulley via a first belt, said auto-tensioning pulley including a first movable flange and spring for maintaining tension in said first belt and said auto tensioning pulley having an operating speed which is infinitely variable between a minimum pitch ratio and a maximum pitch ratio;

an actuating system for moving said first movable flange of said controllable pulley; and

one or more accessories which are driven by said auto-tensioning pulley via a second belt.

14. A variable speed drive system for driving engine accessories comprising:

an engine;

a first controllable pulley in rotational communication with said engine, said first controllable pulley including a first movable flange and a corresponding adjustable pitch radius;

a second controllable pulley driven by said first controllable pulley via a first belt, said second controllable pulley having a second movable flange, and an operating speed which is infinitely variable between a minimum pitch ratio and a maximum pitch ratio;

[an] a first electro-mechanical actuating system for moving said first movable flange;
a second electro-mechanical actuating system for moving a second movable flange; and
a belt driving sheave attached to said second controllable pulley which drives one or more accessories via a second belt

17. A variable speed drive system for driving accessories comprising:

a rotational member;
an auto-tensioning pulley in rotational communication with said rotational member, said auto-tensioning pulley for maintaining tension in a first belt;
a controllable pulley driven by said auto-tensioning pulley via said first belt, said controllable pulley including a first movable flange and a corresponding adjustable pitch radius, and said controllable pulley having an operating speed which is infinitely variable between a minimum pitch ratio and a maximum pitch ratio;
an actuating system for moving said first movable flange;
a control logic module for receiving data from one or more sensing devices and for signaling the actuating system; and
one or more accessories which are driven by said controllable pulley via a second belt.